Diabologic: Planetary Resources

by Frank Dolinar

The appeal of "What If" started when a friend in grade school gave me a copy of Robert A. Heinlein's book Red Planet, the very first science fiction (SF) book I'd ever seen, let alone read. I was eight years old. I very rapidly became a fan of the genre, helped along by a local librarian who also read SF.

As readers of these essays will have noted, I've recently become an advocate (in real life) of one of SF's recurring themes, managing our local space, specifically the stuff in and near the Earth-Moon system. This brings me to this month's topic, the creation of Planetary Resources, a new company whose mission statement – stated simply – is to build spacecraft and mine asteroids.

Before you decide that this is pure science fiction, you might want to read the text below, a recent entry from Slashdot.org, that shows plenty of promise, lots of science & engineering talent, but no fiction.

> Planetary Resources Confirms Plan To Mine Asteroids
> Tuesday April 24, 2012 @ 11:33AM
> Matching widespread predictions, The Bad Astronomer writes with word that *"The private company Planetary Resources has announced that it plans to mine asteroids for water, air, and even precious metals in the next few years. Your initial reaction may be to snicker a bit, but it's headed by Peter Diamandis — who established the X Prize — has several ex-NASA personnel running the engineering, and also has the backing of a half-dozen or so billionaires. So this is no joke — their plan looks solid, and may very well be the first step in establishing a permanent human presence in space."*

How will this work? The announced business plan includes a mere handful of steps, each of which is crucial to the overall mission. Based on my current understanding, these are:

1. Beginning within 24 months, launch of a growing fleet of tiny astronomy satellites (designated the Arkyd 101) to identify and track a class of asteroids known as near-Earth objects (NEO).
2. Identification of such asteroids that will come close enough to Earth to allow these objects to be approached and surveyed by the second version of the Arkyd spacecraft, the surveyors, which will allow close evaluation of the structure and content of these asteroids. Planetary Resources is specifically looking for asteroids composed of water ice and platinum group metals. The water can be split into hydrogen (for fuel) and oxygen (for atmosphere), the metals can be mined, separated, smelted, and used as raw materials for orbital industry.
3. Landing on selected asteroids, stabilizing any spin/tumble motion, and moving them to either lunar orbit or to a stable Lagrangian point (e.g. L5) in the moon's orbital path around Earth.
4. Mining selected asteroids using the third form of the Arkyd spacecraft and delivering the resultant raw materials where and as needed.

Will this be easy? No!
Will there be problems, mistakes, failures? Almost certainly.
Will it work? Yes!!

Planetary Resources mission plan is a dramatic departure from business as usual in the space program. With the financial and technical expertise that Planetary Resources has gathered together, a philosophy that accepts that mistakes will happen and be learned from, and an approach that expects a long term effort, even given the excellence of its resources, this will work.

The effort is already underway. Planetary Resources knows it will take years before it has a set of mature technologies and years more before it begins to make money. However, once it has passed the stage of "proof of concept", it will not only make money (for the company and its investors), it will change our perception of working in space, and become the beachhead for permanent human expansion into space.

It's the beginning of the space program I've been waiting for since the end of the Apollo missions.

It's about time.

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